WHAT IS CLAIMED IS:

1. A combine thresher having a continuous grain moisture analyzer comprising;

a combine thresher having means for moving grain form a grain floor of the combine to a storage bin therein with said moving means being enclosed by an external wall of said combine;

a grain moisture analyzer assembly mounted on said external wall of said combine; and

means for bypassing a portion of the grain passing through said moving means through said grain moisture analyzer.

2. A combine as set forth in claim 1 wherein said bypassing means includes an inlet opening and an outlet opening formed in said external wall of said combine for supplying and exhausting grain to and from said grain moisture analyzer.

3. A combine as set forth in claim 2 wherein said moisture analyzer has a sensing cell for measuring grain moisture and including feed means for moving the grain from said sensing cell to said outlet opening formed in said external wall.

4. A combine as set forth in claim 3 including means for determining the grain when said sensing cell is filled with grain and establishing a control signal indicative thereof.

5. A combine as set forth in claim 4 including microprocessor means responsive to said control signal for activating said feed means to exhaust grain from said sensing cell to thereby establish a bypass of a portion of the grain in said moving means.

6. A combine as set forth in claim 5 wherein said moving means includes a

grain floor, a grain elevator and a bin auger and wherein said inlet opening is formed to communicate with said grain elevator and said outlet opening is formed to communicate with said bin auger.

5 ~~7.~~ A combine as set forth in claim 3 ~~5~~ wherein said moving means includes a grain floor, a grain elevator and a bin auger and wherein said inlet opening is formed to communicate with said bin auger.

6 ~~8.~~ A combine as set forth in claim 3 ~~5~~ wherein said moving means includes a grain floor, a grain elevator and a bin auger and wherein said inlet opening is formed to communicate with said elevator.

~~9.~~ A grain moisture analyzer assembly suitable for ex-situ mounting on an external surface of a combine harvester providing access to grain therein comprising;

a sensing cell for measuring the moisture of grain filling said cell;

detector means for sensing the full condition of said sensing cell and establishing a control signal indicative thereof; and

flow means for moving grain from said sensing cell in response to the control signal from said detector means.

8 ~~10.~~ A grain analyzer as set forth in claim 7 ~~9~~ wherein said detector means includes a light emitting diode located proximate to said sensing cell top surface to emit a light beam there along and a photo receiver located proximate to said sensing cell top surface to receive said light beam from said light emitting diode whenever said sensing cell is not filled with grain and to not receive said light beam whenever said sensing cell is filled with grain.

9 ~~11.~~ A grain analyzer as set forth in claim 7 ~~9~~ including an operator interface

module for controlling said analyzer assembly in response to operator inputs and control signals from said analyzer assembly.

~~12.~~ A grain analyzer as set forth in claim 11 wherein said operator interface module includes a first microprocessor connected to said cell dual detector means to actuate said flow means in response to said control signal from said detector means.

~~13.~~ A grain analyzer as set forth in claim ~~12~~ wherein said operator interface module includes a second microprocessor communicating with said first microprocessor and having a keypad for providing operator inputs thereto.

~~14.~~ A grain analyzer as set forth in claim ~~13~~ wherein said first microprocessor converts the output signal from said sample cell to a grain moisture reading using stored conversion information and communicates same to said second microprocessor to be averaged therein in response to an operator command inputted over said keypad.

~~15.~~ A grain analyzer as set forth in claim ~~14~~ wherein said second microprocessor has a memory for storing the averaged grain moisture readings and displaying same to a visual display as well as forwarding same to an external computer for further processing.

~~16.~~ A method of providing continuous grain moisture readings of the grain being harvested to a combine harvester operator comprising the steps of:

passing a portion of the grain being harvested from the combine to a moisture analyzer sensing cell mounted ex-situ of the combine;

filling said sensing cell with the passed grain; and

actuating the passing of the grain from the sensor cell back to the combine to provide a continuous bypass of grain from the combine through the sensor cell and continuous moisture measurement thereby.

17. ~~A method as set forth in claim 16 including the averaging of continuous~~ grain moisture measurements ~~over~~ an operator determined period.

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~~18.~~ A method as set forth in claim ~~17~~ including the stopping of the bypass of grain to the sensing cell whenever the sensing cell is not filled with grain.

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~~19.~~ A method as set forth in claim ~~18~~ including the stopping of grain moisture measurements whenever the sensing cell is not filled with grain.

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~~20.~~ A method as set forth in claim ~~19~~ including the displaying to the combine operator of the type of grain being harvested along with the moisture content thereof.

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~~21.~~ A combine as set forth in claim 1 wherein said grain moisture analyzer assembly includes an impedance cell having a plurality of plates to increase the measuring sensitivity of the moisture analyzer and with the external two plates being ground plates to reduce EMI and RFI interference thereby.

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~~22.~~ A combine as set forth in claim ~~21~~ wherein said plurality of plates is five plates with two central readout plates and three ground plates forming four separate measuring chambers.

23. A grain moisture analyzing assembly as set forth in claim 9 wherein said sensing cell includes an impedance cell having a plurality of plates to increase the measuring sensitivity of the moisture analyzer and with the external two plates being ground plates to reduce EMI and RFI interference thereby.

20 ~~24.~~ A grain moisture analyzing assembly as set forth in claim 23 wherein said plurality of plates is five plates with two central readout plates and three ground plates forming four separate measuring chambers.

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~~25.~~ A grain moisture analyzing assembly as set forth in claim ~~24~~ wherein two of said three ground plates are the outer plates of said five plate assembly.

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~~26.~~ A method as set forth in claim ~~16~~ including the step of passing the portion of the grain to a plurality of sensing cells formed from a five plate impedance sensing cell having a pair of central plates and three ground plates.

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~~27.~~ A method as set forth in claim ~~16~~ including the step of passing the portion of the grain to a sensing cell formed from an impedance moisture measuring cell having a plurality of plates for increased measurement sensitivity.

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~~28.~~ A method as set forth in claim ~~16~~ including the step of passing the portion of the grain to a sensing cell formed from an impedance moisture measuring cell having a pair of external ground plates to minimize EMI and RFI interference thereby.

~~29.~~ A method as set forth in claim 16 including the step of automatically setting the frequency of the cell voltage to optimum for the broadest range of moisture sensed by the cell.

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~~30.~~ A method as set forth in claim ~~29~~ wherein the step of automatically setting the frequency includes the step of solving the equation $V_{OUT} = V(f)\{A - BR_e(1-e^{-t/2ReCs})\}$ by a microprocessor after the application of a DC voltage to the cell.

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~~31.~~ A method as set forth in claim ~~30~~ including the step of applying a known squarewave frequency to the cell and measuring the resultant V_{OUT} in the equation $V_{OUT} = V(f)\{A - BR_e(1-e^{-t/2ReCs})\}$.

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~~32.~~ A method as set forth in claim ~~31~~ including the step of solving the equation

$V_{OUT} = V(f)\{ A - BR_e (1-e^{-t/2ReCs})\}$ for t and hence the optimal frequency.

and 27